

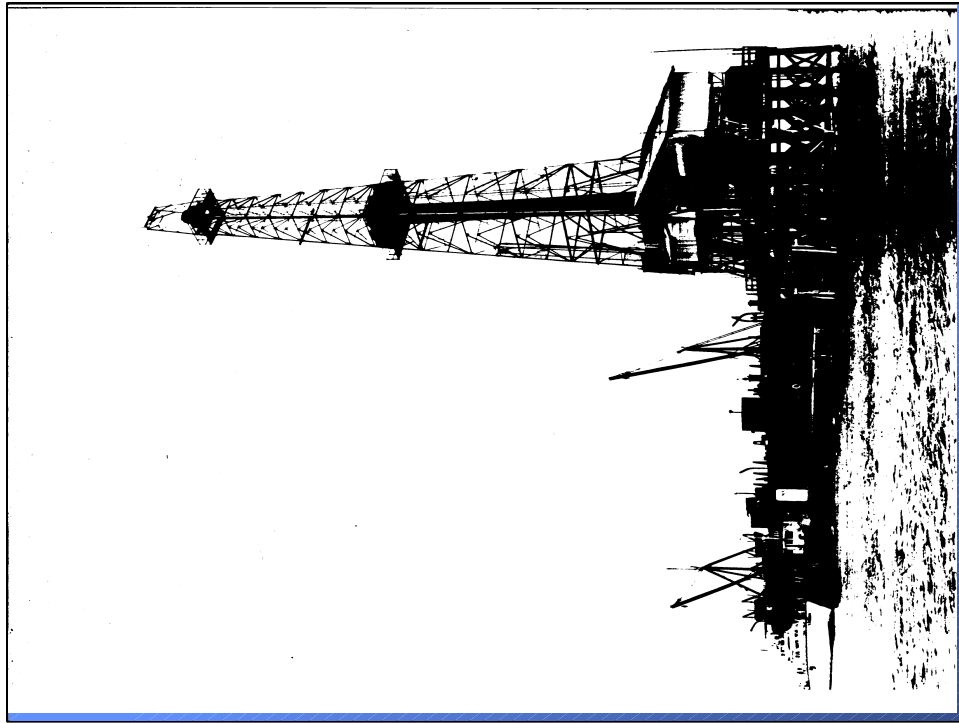
MMS and the New Frontiers

Cynthia Quarterman
Director
Minerals Management Service



Offshore Technology Conference, May 5, 1997

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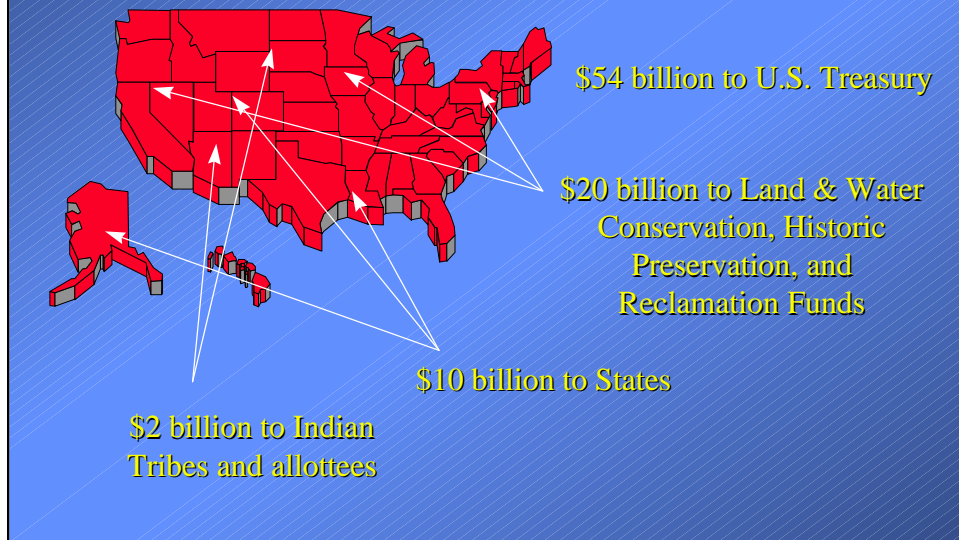
- In November 1947, Kerr McGee completed the first successful well drilled from a fixed platform out of sight of land, about 12 miles offshore Louisiana. Since that time, the Gulf of Mexico has continued to be the site of remarkable breakthroughs in exploration and development of oil and gas. I wish to congratulate you all on 50 years of extraordinary accomplishments.
- We can also celebrate another anniversary today — 1997 marks the 15th birthday of the Minerals Management Service.



*To manage the mineral resources on the Outer
Continental Shelf in an environmentally sound
and safe manner
and
To timely collect, verify, and distribute
mineral revenues from Federal and
Indian lands*

- In 1982, an independent Commission on Fiscal Accountability of the Nation's Energy Resources (known as the Linowes Commission) recommended that proper fiscal accountability and management of the public's mineral resources would best be served by an agency devoted solely to minerals management.
- The Secretary of the Interior established MMS with the mission to manage the mineral resources of the Outer Continental Shelf in an environmentally sound and safe manner and to timely collect, verify, and distribute mineral revenues from Federal and Indian lands.

MMS has collected over \$86 billion since 1982



- The Royalty Management Program has matured from a collection agency to a world-class financial manager. Since its inception, RMP has:
 - Collected over \$86 billion dollars from Federal and Indian leases (\$4.9 billion in 1996 alone).
 - Collected almost \$1.9 billion of this through our programs to detect underpayments.
 - Distributed this money to 38 States, 41 tribes, 20,000 Indian allottees, the U.S. Treasury and other Federal funds.

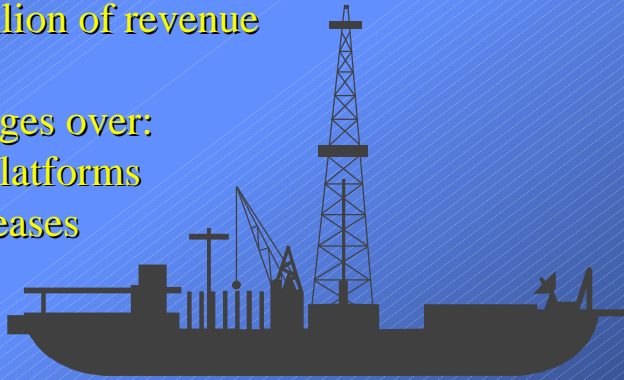
The OCS Program

Since 1982:

- 4.5 billion barrels of oil
- 58 trillion cubic feet of gas
- \$69 billion of revenue

Today, manages over:

- 3800 platforms
- 6400 leases



- The Offshore Minerals Program, once purely process-driven, has grown into a dynamic resource manager. OMM:
 - Has overseen production of 58 trillion cubic feet of gas and 4.5 billion barrels of oil, accounting for \$69 billion in revenues, since 1982.
 - Administers 6400 leases with over 3800 production platforms.

MMS wants to be the “best in the business”

1991: Award of Excellence, Pres. Council on
Management Improvement

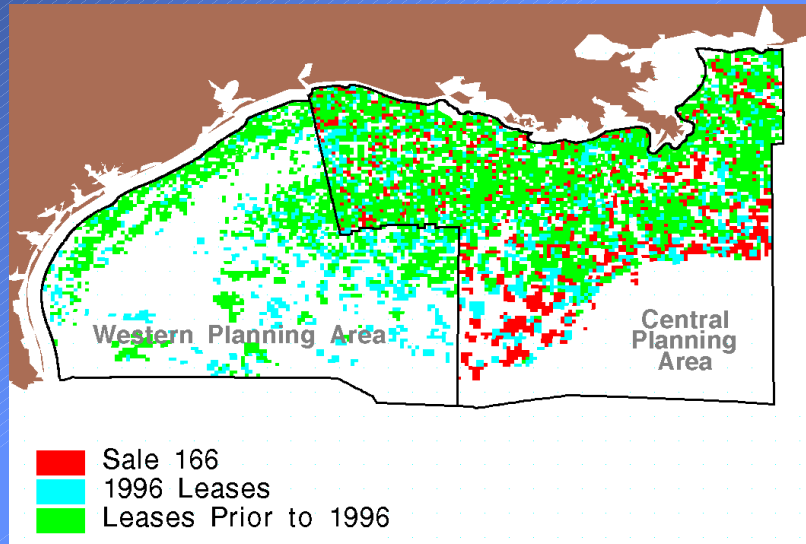
1993 & 1994: Finalist, Quality Improvement
Prototype Award

1994 & 1996: Federal Environmental Quality
Award, CEQ & NAEP

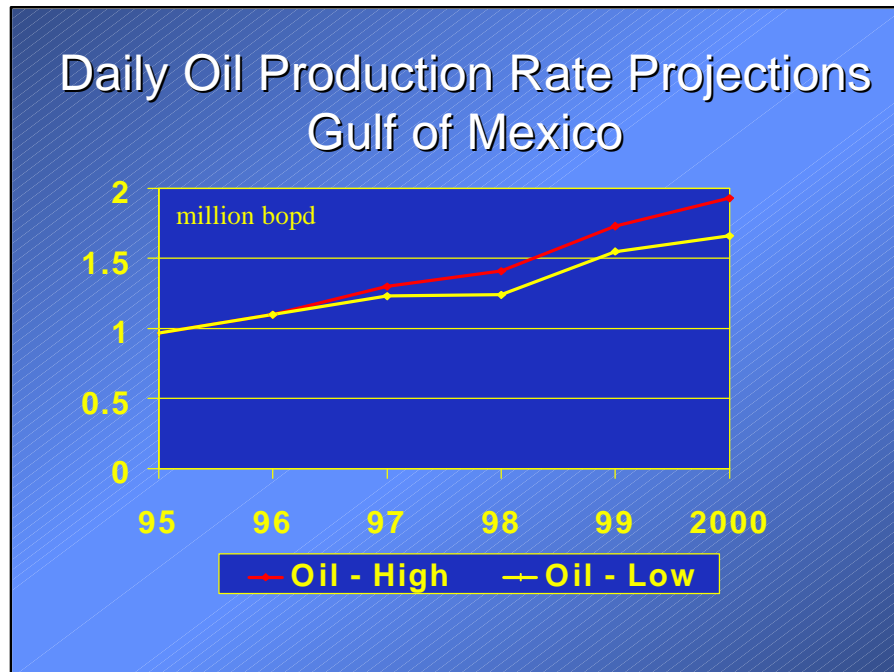
1995 & 1997: Vice President’s Hammer Award

- From the disarray of a failed mineral revenue program, MMS has forged a record of achievement in our quest to become the best mineral resources manager in the world.

Active Leases in The Central & Western Gulf of Mexico

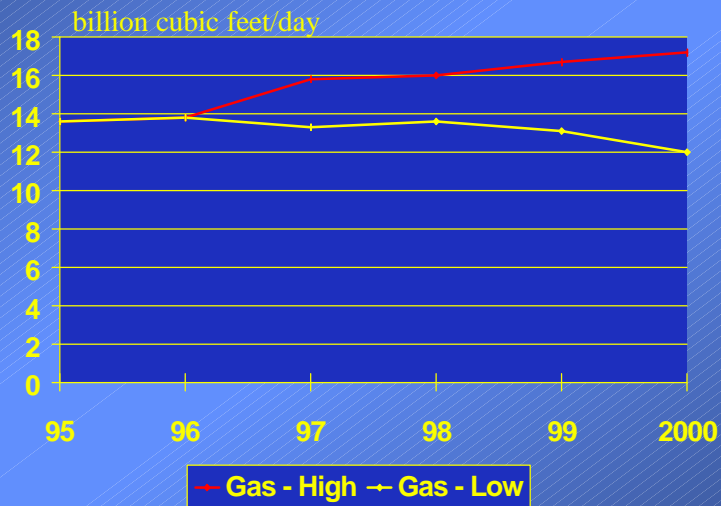


- But this conference is about the future, not the past. I will tell you about some of the things we are doing to push the frontiers of government service so that you can continue to push the technological frontiers of oil and gas exploration and development. We think the next 15, or 50 years can be more exciting than the last.
- Nothing illustrates the future's potential more than our recent lease sales in the Gulf of Mexico. We have held three record-breaking sales in a row, with over 2500 tracts attracting over \$1.6 billion in high bids. In March, we had our first billion dollar sale (in exposed bids) since the heyday of the early 1980's.



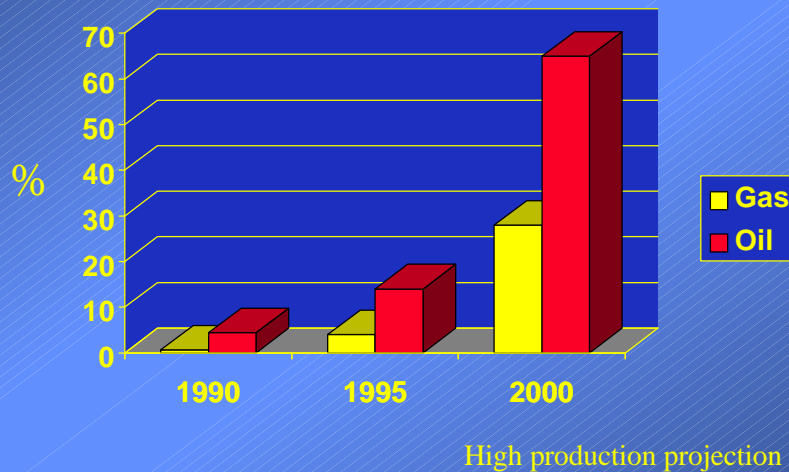
- Much of this new leasing is in the deep water portions of the Gulf of Mexico, and that's the topic you invited me here to address.
- As you know, the potential of the deep water Gulf is enormous:
 - It's a dominant factor in our projections that Gulf oil production will double between 1995 and 2000, from 900,000 barrels of oil per day to as much as 1.9 million barrels per day....

Daily Gas Production Rates Projections Gulf of Mexico

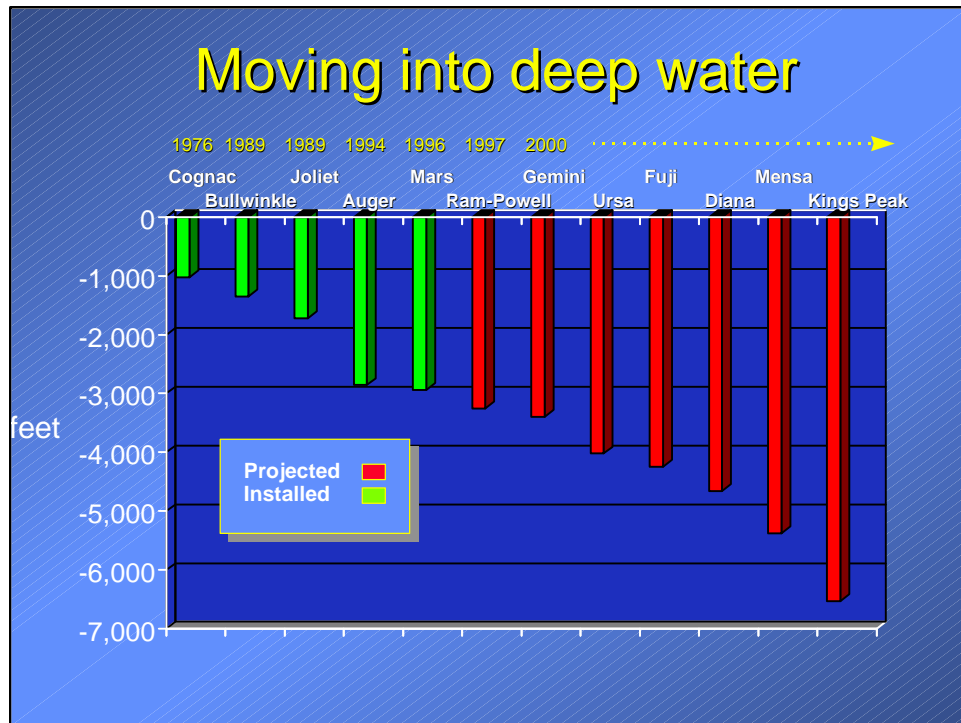


→ ... Natural gas production may increase too, from 13.9 billion cubic feet per day to as much as 17.2 bcf per day.

Share of Gulf of Mexico Production From Fields in More Than 1000' of Water



- In 1990, fields in more than 1000 feet of water accounted for about 4 percent of total Gulf oil production and less than 1 percent of total Gulf natural gas production. In 1995, such fields accounted for about 14 percent of Gulf oil production and 4 percent of the gas production. By the year 2000, deep water fields may produce almost two-thirds of the Gulf's oil and over one-fourth its gas.
- By the year 2000, we expect 40 deep water fields will be producing, with reserves of almost 2.5 billion barrels of oil and 8.2 trillion cubic feet of gas.



- Industry is going into ever deeper water depths. The 1,000 foot barrier was broken in 1976 (Cognac), and again in 1989 (Bullwinkle and Joliet). The current deep water production record is 2,940 feet (Mars), and the 3000 foot barrier should fall later this year. We project the 4, 5, and even 6,000 foot depths to be breached in rapid succession by the end of the decade. You have drilled exploration wells in more than 7000 feet of water, and 10,000 foot depths may not be far behind.

Deep Water Development Challenges

- Technology
- Logistics
- Environment
- Economics



- The challenges posed by these deep water discoveries are especially daunting. One development scenario foresees TLP or SPAR-type platforms for developing large reservoirs and distant subsea completions. Smaller reservoirs may be produced from reusable floating platforms moored on location. Pipeline networks will extend off the continental shelf and down the slope to service these facilities. These scenarios require innovative platform, mooring system, and pipeline designs. For example:
 - Shell's Mensa project will develop a natural gas discovery in a water depth of over a mile, surpassing the world's record for deepest production by about 2000 feet. It will produce from up to 4 subsea wells connected by pipeline to a platform 68 miles away. This will be the longest connection of its kind and provides a model for future development of satellite fields.
 - Texaco's Petronius project will produce from a compliant tower in over 1700 feet of water, the first such system in these water depths. This project also faces the challenge of laying deep water pipelines.



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- These are just two examples of how you are confronting the challenges of deep water; virtually every new project proposes a technological innovation.
- This growth poses many challenges for MMS as well, as we work to understand and evaluate new technological issues, economic risks and potential environmental impacts.

Deep Water Royalty Relief

Since enactment, Gulf sales have focused on deep water tracts eligible for relief:

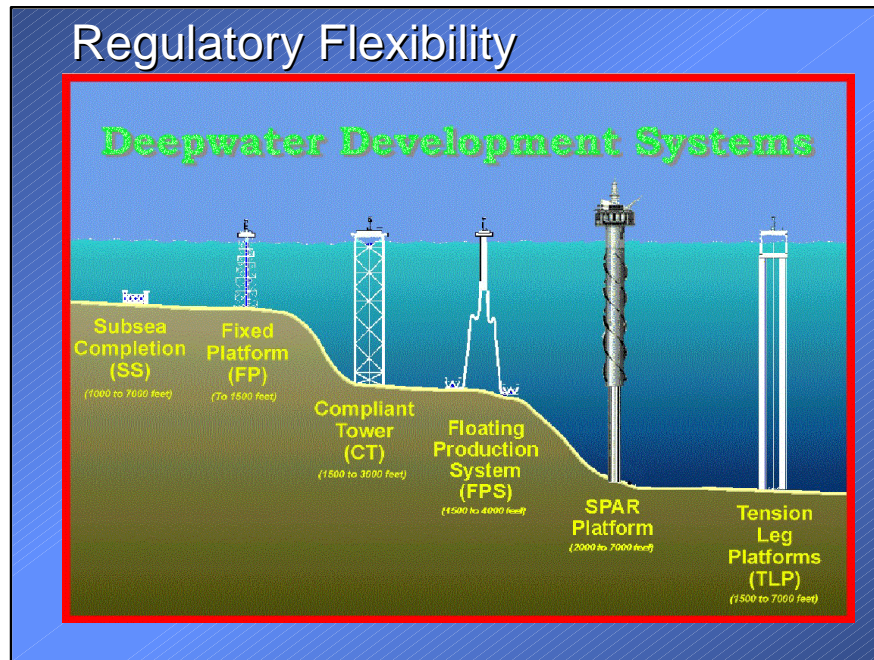


→ 1524 received bids

→ 60% of all blocks with bids in sale

→ ~ \$1 billion in high bids

- Let me share with you some of the things we're working on that will allow us to continue to be an effective resource manager in deep water.
- *Deep Water Royalty Relief*: The OCS Deep Water Royalty Relief Act of 1995 established a royalty suspension program for deep water leases in the Central and Western Gulf of Mexico.
 - Last year, we quickly developed two interim rules to allow for full implementation of the Act's incentives, which provide automatic relief for new leases and relief where economically warranted for already-existing leases. We believe this was an important contributor to the record-setting lease sales over the past year, and we are currently evaluating our first application for royalty relief from an older lease.
 - We received many thoughtful comments from industry on these rules, and we are currently working on changes. Final rules should be published before the end of the year.



- *Regulatory Flexibility*: MMS regulations were developed over the years based on our wealth of experience with conventional technologies in shallow waters. It rapidly became apparent that the technical issues associated with deep water operations require new approaches to regulation. We have worked with you on several fronts to provide the flexibility you need to proceed with your plans while still ensuring safe and environmentally sound operations.
 - *Deep Water Operations Plans*: Lessees and operators have expressed concerns about the uncertainty of developing deep water projects because the existing regulations do not address the design and operating issues facing such projects. We created the Deep Water Operations Plan (DWOP) requirement to address industry's and our concerns by allowing an operator to know, well in advance of significant spending, whether their proposed methods of dealing with situations not specifically addressed in the regulations cause significant concerns or are acceptable to MMS. The DWOP allows us to review deep water development activities from a total system perspective, emphasizing operational safety, environmental protection, and conservation of natural resources.

Regulatory Flexibility

MMS allows alternative compliance on up to 27 regulations for deep water projects.

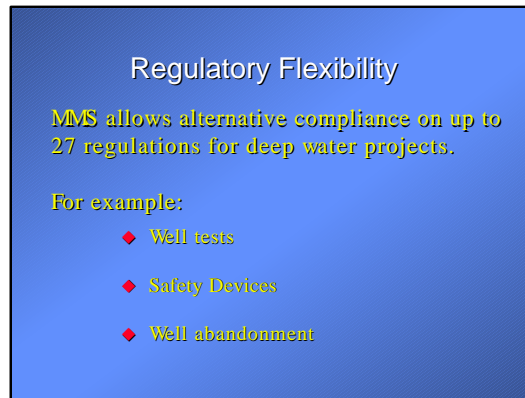
For example:

- ◆ Well tests
- ◆ Safety Devices
- ◆ Well abandonment

→ *Regulatory Departures*: In many cases, existing regulations cannot be applied to proposed deep water operations. We have identified 27 regulations that may require MMS to grant a departure from the rules or approve alternative means of compliance so development may proceed. For example:

- Deep water wells often require extended well tests, which may involve extended or large-volume gas flaring or oil burning.
- Subsea completions require fundamentally different standards than other facilities for location, operation, and testing of safety devices.
- Abandonment and site clearance procedures may prove to be significantly different in deep water than they are for shallow water.
- And we're just beginning to examine the implications of using Floating Production, Storage and Offloading systems and tankers for bringing production to shore.

We work with the operators to make sure such variances afford an equivalent or improved degree of safety.



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- *DeepStar*: We participated in the industry-led DeepStar project, and continue to work with its members keep abreast of rapidly evolving deep water technologies. This allows us to identify and address regulatory issues before projects enter the permitting stage.
- *Conservation*: One of our mandates under the OCS Lands Act is to promote the greatest ultimate recovery of offshore oil and gas resources. The Gulf Region now receives conservation information about deep water or subsea development projects early in the planning phase. The MMS will use this information to assure development of economically producible reservoirs in accordance with sound conservation, engineering, and economic practices. Again, this will allow us to work together to resolve any concerns while projects are still at a stage where plans can be adjusted without great expense.

New Environmental Challenges

- ◆ Chemosynthetic communities
- ◆ Protected species
- ◆ Socioeconomics
- ◆ Air & water quality
- ◆ Assessing large oil spill scenarios



tube worms

- *Environmental Issues:* As operations move into deeper waters, we'll be entering novel environments and operating conditions. In order to conduct environmental reviews of proposed activities, we'll need to improve our understanding of a number of issues. For example:
 - Chemosynthetic communities are assemblages of tube worms, clams, mussels, and bacterial mats that occur at natural hydrocarbon seeps or vents, generally in water depths of 500 meters or deeper. We require owners and operators of leases to avoid these communities, but we do not know: how many of these communities exist in the Gulf of Mexico; how to predict their locations; or how they respond to a range of natural environmental variations. The answers to these questions will give MMS a greater predictive capability to manage operations in the vicinity of chemosynthetic communities.

New Environmental Challenges

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tube worms

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- Protected species, such as endangered marine mammals and sea turtles, occur throughout the Gulf of Mexico. Relatively little is known about the numbers and distribution of marine mammals in the southern Gulf. To meet the mandates of the Marine Mammal Protection Act and the Endangered Species Act, we need to know more about the basic biology of deep-diving, oceanic species like the endangered sperm whale.
- With respect to socioeconomic impacts, the increasing number of deep-water leases provides us a unique opportunity to assess a "boom" cycle in the Gulf of Mexico. Port Fouchon, Louisiana is the only deep draft port between the mouth of the Mississippi and Lake Charles that can accommodate deep draft support vessels required of deep water development. Socioeconomic impacts are already presenting themselves in Port Fouchon, where over 1,000 trucks a day travel on a small gravel road.



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- Water quality issues arise from different operating practices, for example: (1) concentrated discharges at central facilities hosting satellite developments; (2) higher volumes of cuttings and the use of synthetic based drill muds that may be less toxic but remain in the environment longer than drill muds traditionally used in shallower environments; and (3) the wider dispersion of discharges expected in deep water.
- Similarly, air quality issues arise from (1) extended gas flaring and oil burning during well tests; and (2) concentrated emissions at centralized host facilities.
- Finally, our environmental analyses need to consider potential oil spill scenarios from large volume projects with well production rates of 13,000 to 25,000 barrels per day, compared to high-end scenarios of 5,000 barrels per day in shallow water.
- These examples are only some of the questions we need to address to avoid development-related impacts on the deep water environment. We've just completed a workshop to help identify the issues that require additional study. Our goal is to fill these information gaps so the NEPA compliance and permitting processes can run smoothly as you move forward with your plans.

Technology Assessment & Research

- Ensure safe and pollution-free operations
- Promote best available and safest technology
- Ensure that up-to-date technologies are incorporated into regulations
- Provide leadership in offshore safety and pollution prevention through cooperative research and dialogue

- *Technology Assessment and Research:* MMS actively pursues new technologies through its Technology Assessment and Research Program in order to:
 - ensure safe and pollution-free operations;
 - facilitate the use of best available and safest technology, as mandated by the OCS Lands Act;
 - ensure that the use of up-to-date technologies is incorporated into our regulations; and,
 - provide leadership in offshore safety and pollution prevention through cooperative research and dialogue with the oil and gas industry.

Technology Assessment & Research

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- Examples of efforts we're funding to support deep water development include research into:
 - Well control procedures to avoid blowouts in deep water, where drilling relief wells is extremely difficult. MMS is supporting the Well Control Facility at Louisiana State University in a variety of research projects. Some recent examples include:
 - A mud pulse telemetry system to get real-time information on down hole drilling and formation conditions such as temperature, porosity, and pressure. This will allow better well control as well as anticipation and management of high pressure "kicks".
 - An improved diverter design for improved well control.
 - The construction of an experimental 10,000 ft. flow line loop which will allow numerous well control and sensor technologies to be tested under controlled conditions.

Technology Assessment & Research

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(cont.)

- Advanced Materials. MMS is supporting the Composites Engineering and Applications Center (at the University of Houston) in funding a number of research projects applicable to deep water development. One specific example is the development of high strength, low weight risers using composite materials. These space age materials can reduce the weight of extremely long riser pipes, reduce costs, and increase corrosion resistance without any decrease in strength or reliability.
- We've also supported the Deep Water Offshore Technology Research Center at Texas A&M, which serves as a test facility to model forces acting on deep water structures and pipelines and supports other technology research.
- MMS will continue its leadership role in sponsoring and cosponsoring international workshops to bring the research community together to focus on applied technical problems and solutions. Recent examples include workshops on human and organizational factors, composite materials, pipeline integrity, and platform decommissioning.
- All of this work will provide a basis for adapting our regulatory program and for making permitting decisions to facilitate the use of the innovative technologies required for deep water operations.

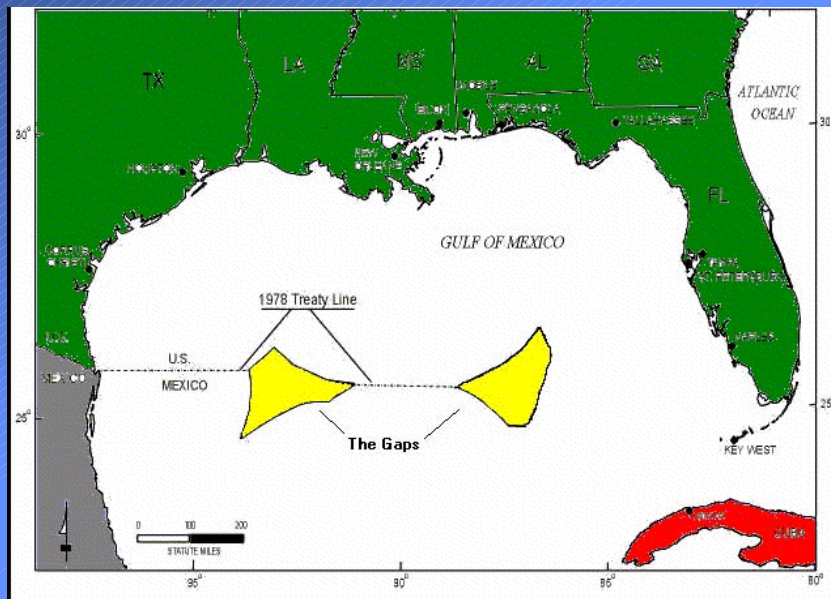
Safety Challenges

- ◆ Well control
- ◆ Well testing
- ◆ Subsea operations
- ◆ Floating production systems
- ◆ Pipelines



- *Safety Challenges:* Deep water operations also raise some new safety issues. Our primary concerns continue to be the health and safety of offshore workers and environmental protection. The main challenge is to conduct incident-free operations while working with unknown reservoir characteristics and new operating conditions. Specific challenges include:
 - Well-control during the drilling of deep water wells;
 - Adequate testing of exploration and development wells;
 - Subsea well operations and intervention;
 - Riser and mooring designs for floating production systems; and
 - Pipeline installation in deep water and hydrate and paraffin plugging in pipelines.
- Some of the new technologies on display here this week will help to address these challenges.

United States - Mexico Boundary



- *U.S. - Mexico Boundary:* As you continue to push the limits of drilling and production technology, you will start to run into other sorts of boundaries. Nearly 20 years ago, in 1978, the United States and Mexico signed a treaty which defined the maritime boundaries between the two countries in the Gulf of Mexico. While the Mexican government has ratified this treaty, the United States has not. In addition to the established boundaries in the still unratified treaty, there are two "gaps" beyond 200 miles which remain unresolved with Mexico and which will required further negotiation to delimit our respective continental shelves. With regard to the western "gap", for OCS planning purposes, we have been using a hypothetical equidistant line. But, with deep water leasing interest moving closer and closer to this gap, we have been working with the State Department to seek Senate action on the 1978 Treaty so that it can enter into force. Once the U.S.-Mexico treaty is ratified, we can then move forward with Mexico to negotiate the continental shelf boundary in the western "gap". We seek resolution of this matter so that offshore sales can proceed without the possibility of a boundary dispute with the Government of Mexico.

MMS is Pushing Other Frontiers

- Shallow water Gulf of Mexico
- Eastern Gulf of Mexico
- Alaska
- California
- Royalty Management Program

- While deep water activities are clearly a critical focus of our attentions, I don't want to leave you with the impression that there's no other excitement. We are pushing the envelope in a number of other areas, too:
- *Shallow water Gulf*: As you can see on the map, the Gulf is thriving on the shelf too. There are a host of new challenges to confront here as well, including:
 - development of the subsalt play and other new horizons;
 - the explosion of smaller companies becoming active offshore, some with little experience on the OCS; and
 - existing infrastructure that's nearing the end of its design life.

MMS is Pushing Other Frontiers

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(cont.)

- *Eastern Gulf of Mexico:* We've received a development plan for a natural gas field offshore the Florida panhandle, and we expect some additional exploratory wells on existing leases in the Eastern Gulf. We are working closely with the State of Florida, local interests, and the lessees to ensure that these projects will proceed in a safe and environmentally sound manner. Also, our new 5-Year Leasing Program for 1997-2002 includes a lease sale in the Eastern Gulf of Mexico Planning area which draws no objection from the neighboring States and would be the first sale in that Planning Area since 1988.
- *California:* OCS production offshore California doubled since 1985 to almost 200,000 barrels per day, before falling back to about 170,000 barrels per day, partly due to working extensively with local constituents to identify and resolve issues. In a cooperative effort with industry and the State, we're working on the California Offshore Oil and Gas Energy Resources (COOGER) Study, which will examine development scenarios for the existing undeveloped leases offshore California to minimize any further impact on the coast and its resources. COOGER should be completed in 1998.
- *Alaska:* A string of recent discoveries along the North Slope will support the expansion of infrastructure that will allow "smaller" discoveries to become economic. We already have our first Development and Production Plan for the Beaufort Sea (a joint Federal-State unit), and other prospects are being explored. First production from the Alaska OCS is just around the corner!

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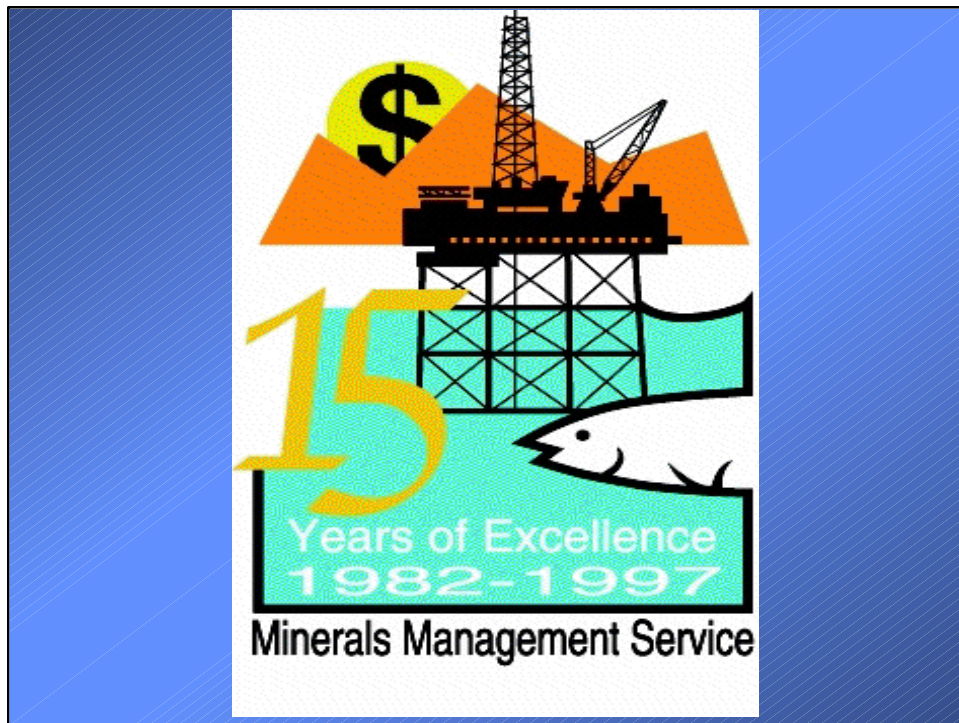
- *Royalty Management*: The Royalty Management Program is undergoing dramatic changes that will significantly impact how we interact with industry and the States.
 - *RSFA*: Last year's Royalty Simplification and Fairness Act changes a number of aspects of the Royalty Management Program, from delegating certain functions to states, to encouraging continued production from marginal properties, to assuring cost-effective audit and collection activities. We are committed to implementing this Act within the very ambitious time frames set by the law.

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(cont.)

- *Royalty Management Program Reengineering Project:* MMS recently began a major project to intensively evaluate strategies to ensure that mineral lease revenues are paid on time and accurately. This comprehensive effort will involve several aspects:
 - (1) implementation of systems and operational changes related to the RSFA;
 - (2) evaluation of royalty management processes and automated systems to meet future requirements;
 - (3) development of the best and most cost-effective operational strategies and organizational structures for the future; and
 - (4) implementation of short and long-term systems and process changes.



- As you can tell, I'm excited about the opportunities and challenges that await us all as we continue the remarkable history of offshore development. Today, I wish to pledge to you that we will serve as partners in making that future just as remarkable as the past.
 - We will continue to work cooperatively with you to identify and resolve issues quickly.
 - We will be tough, but fair regulators. With your help, we can develop regulations that are more performance-based and less prescriptive, providing you the flexibility to innovate while still ensuring safety and environmental protection.
- Thank you for your attention. I'd be happy to take any questions.